

IN THE CLAIMS

Please revise the claims as follows, with changes being shown by strikethrough, underlining, and/or double brackets. This listing of claims replaces the listing of claims contained in the application.

1. (Currently amended) A conveyance system ~~[[10]]~~ comprising:

a conveyance carriage assembly ~~[[12]]~~ for carrying a workpiece ~~[[1]]~~ thereon; and
conveyance units ~~(16, 18)~~ to which said conveyance carriage assembly ~~[[12]]~~ is
conveyed;

wherein said conveyance carriage assembly ~~[[12]]~~ has driven members;

said conveyance units ~~(16, 18)~~ are separable into units;

each of said units having:

a rail ~~[[28]]~~ for guiding said conveyance carriage assembly ~~[[12]]~~; and

a driver associated with said rail ~~[[28]]~~ for driving said conveyance carriage assembly
~~[[12]]~~ through said driven members; and

wherein when the last one of said driven members is separated from a movable range of
said driver, at least the foremost one of said driven members is relayed to said driver of the unit
adjacent thereto and said conveyance carriage assembly ~~[[12]]~~ is continuously conveyed.

2. (Currently amended) A conveyance system according to claim 1, wherein each of said
units includes:

two said rails ~~[[28]]~~; and

two said drivers associated respectively with two said rails;

wherein two said rails extend parallel to each other; and

two said drivers convey said conveyance carriage assembly ~~[[12]]~~ in opposite
directions, respectively.

3. (Currently amended) A conveyance system according to claim 2, wherein said units

comprise three units including:

a horizontal conveyance unit $[(16)]$ for linearly conveying said conveyance carriage assembly $[(12)]$;

a gradient conveyance unit $[(18)]$ for conveying said conveyance carriage assembly $[(12)]$ on an upward grade and/or a downward grade; and

a direction-changing unit $[(20)]$ for changing a conveyance direction of said conveyance carriage assembly $[(12)]$;

wherein a plurality of types of said units are combined with each other.

4. (Currently amended) A conveyance system according to claim 1, wherein said driver comprises an annular chain $[(30)]$ which is circulatingly drivable through a sprocket $[(36)]$; and

said driven members comprise driven sprockets ~~(246, 266e, 266d)~~ held in mesh with said annular chain $[(30)]$ or a presser plate $[(242)]$ for pressing rollers $[(30a)]$ of said annular chain $[(30)]$.

5. (Currently amended) A conveyance system according to claim 1, wherein said rail $[(28)]$ is in the form of a plate which is elongate in a conveyance direction; and

said conveyance carriage assembly $[(12)]$ moves laterally of said rail $[(28)]$, and carries the workpiece $[(1)]$ on a side of said rail $[(28)]$.

6. (Currently amended) A conveyance system according to claim 1, wherein said conveyance units ~~(16, 18)~~ include:

a plurality of horizontal conveyance units $[(16)]$ for conveying said conveyance carriage assembly $[(12)]$ in a substantially horizontal direction; and

a gradient conveyance unit $[(18)]$ interconnecting two of said horizontal conveyance units $[(16)]$;

wherein said gradient conveyance unit [(18)] comprises:

a gradient conveyance drive sprocket [(170)] disposed closely to an end of the gradient conveyance unit [(18)], said gradient conveyance drive sprocket [(170)] being rotatable by said driver;

a gradient conveyance driven sprocket [(172)] disposed closely to an opposite end of the gradient conveyance unit [(18)], said gradient conveyance driven sprocket [(172)] being rotatable;

a gradient conveyance annular chain [(162)] held in mesh with said gradient conveyance drive sprocket [(170)] and said gradient conveyance driven sprocket [(172)], said gradient conveyance annular chain [(162)] being circulatingly drivable; and

a gradient guide [(176)] for supporting, from below, an upper portion of said gradient conveyance annular chain [(162)] which imparts drive power to said conveyance carriage assembly [(12)] and a lower portion of said gradient conveyance annular chain [(162)] which is guided in a direction opposite to said upper portion, making said gradient conveyance annular chain [(162)] upwardly convex in shape;

wherein said conveyance carriage assembly [(12)] has a gradient conveyance driven sprocket [(246)] positioned near a leading end of the conveyance carriage assembly [(12)] in a conveyance direction and held in mesh with said gradient conveyance annular chain [(162)]; and

wherein after said conveyance carriage assembly [(12)] is pushed out from said horizontal conveyance unit [(16)], said driven sprocket [(246)] is brought into mesh with said gradient conveyance annular chain [(162)], and said conveyance carriage assembly [(12)] is conveyed by said gradient conveyance annular chain [(162)] along the shape of said gradient guide [(176)].

7. (Currently amended) A conveyance system according to claim 6, wherein said conveyance carriage assembly [(12)] comprises at least two conveyance carriages

interconnected longitudinally by a vertically swingable or elastically deformable joint [(208)].

8. (Currently amended) A conveyance system according to claim 6, wherein each of said horizontal conveyance units [(16)] has:

a horizontal conveyance drive sprocket [(36)] disposed closely to an end of the horizontal conveyance unit [(16)], said horizontal conveyance drive sprocket [(36)] being rotatable by said driver;

a horizontal conveyance driven sprocket [(38)] disposed closely to an opposite end of the horizontal conveyance unit [(16)], said horizontal conveyance driven sprocket [(38)] being rotatable; and

a horizontal conveyance annular chain [(30)] held in mesh with said horizontal conveyance drive sprocket [(36)] and said horizontal conveyance driven sprocket [(38)], said horizontal conveyance annular chain [(30)] being circulatingly drivable and being disposed in a position different from said gradient conveyance annular chain [(162)] in a transverse direction of said horizontal conveyance unit [(16)];

wherein said conveyance carriage assembly [(12)] has a push-out driven sprocket [(266d)] positioned closely to a rear end of the conveyance carriage assembly [(12)], said push-out driven sprocket [(266d)] being positioned above said horizontal conveyance annular chain [(30)] when no external force is applied thereto; and

wherein as said conveyance carriage assembly [(12)] moves, said driven sprocket [(266d)] is lowered into mesh with said horizontal conveyance annular chain [(30)] by a push-out cam plate [(56)] in said horizontal conveyance unit [(16)].

9. (Currently amended) A conveyance system according to claim 8, wherein said driven sprocket [(266d)] is lowered by:

a force-bearing member [(270)] for directly bearing a pressing force from said push-out cam plate [(56)]; and

a resilient member [(268)] compressible in interlinked relation to said force-bearing member [(270)].

10. (Currently amended) A conveyance system according to claim 6, wherein said conveyance carriage assembly [(12)] has:

a lowering driven sprocket [(266c)] disposed closely to a rear end of the conveyance carriage assembly [(12)], said lowering driven sprocket [(266c)] being positioned above said gradient conveyance annular chain [(162)] when no external force is applied thereto;

wherein as said conveyance carriage assembly [(12)] moves, said driven sprocket [(266c)] is lowered into mesh with said gradient conveyance annular chain [(162)] by a lowering cam plate [(180)] disposed in a downgrade region of said gradient conveyance unit [(18)].

11. (Currently amended) A conveyance system according to claim 10, wherein said driven sprocket [(266c)] is lowered by:

a force-bearing member [(270)] for directly bearing a pressing force from said lowering cam plate [(180)]; and

a resilient member [(268)] compressible in interlinked relation to said force-bearing member [(270)].

12. (Currently amended) A conveyance system according to claim 1, further comprising:

a drive gear [(94)] rotatable by a rotational drive source;

a first driven gear [(72)] held in mesh with said drive gear [(94)], said first driven gear [(72)] being rotatable by rotation transmitted from said drive gear [(94)];

a second driven gear [(74)] held in mesh with said drive gear [(94)], said second driven gear [(74)] being rotatable by rotation transmitted from said drive gear [(94)] in a direction opposite to said first driven gear [(72)];

a first rotational shaft [(68)] as a rotational shaft of said first driven gear [(72)];
a second rotational shaft [(70)] as a rotational shaft of said second driven gear [(74)];
a first circulative driver [(30)] for being circulatively drivable in response to rotation of said first rotational shaft [(68)]; and
a second circulative driver [(33)] for being circulatively drivable in a direction opposite to said first circulative driver [(30)] in response to rotation of said second rotational shaft [(70)];
wherein said conveyance carriage assembly [(12)] is conveyed by said first circulative driver [(30)] and/or said second circulative driver [(33)].

13. (Currently amended) A conveyance system according to claim 12, wherein each of said drive gear [(94)], said first driven gear [(72)], and said second driven gear [(74)] comprises a bevel gear, and said first rotational shaft [(68)] and said second rotational shaft [(70)] are coaxial with each other and perpendicular to the axis of said drive gear [(94)].

14. (Currently amended) A conveyance system according to claim 12, further comprising:

a first inner bearing [(67a)] by which an end of said first rotational shaft [(68)] is rotatably supported, and a second inner bearing [(67b)] by which an end of said second rotational shaft [(70)] is supported, said first inner bearing [(67a)] and said second inner bearing [(67b)] being disposed between said first driven gear [(72)] and said second driven gear [(74)]; and

a first outer bearing [(78)] by which an end of said first rotational shaft [(68)] is rotatably supported, and a second outer bearing [(78)] by which an end of said second rotational shaft [(70)] is supported, said first outer bearing [(78)] and said second outer bearing [(78)] being disposed on sides of said first driven gear [(72)] and said second driven gear [(74)] which are opposite to confronting faces thereof.

15. (Currently amended) A conveyance system according to claim 12, wherein said first circulative driver [(162)] is driven by a first drive sprocket [(36)] mounted on said first rotational shaft [(68)];

said second circulative driver [(162)] is driven by a second drive sprocket [(37)] mounted on said second rotational shaft [(70)]; and

said first circulative driver [(162)] and said second circulative driver [(162)] comprise annular chains [(30)], respectively, and are circulatingly drivable by rotatable driven sprockets [(38)].

16. (Currently amended) A conveyance system according to claim 1, wherein said conveyance carriage assembly [(12)] has:

a retaining mechanism for retaining the workpiece [(1)];

a retaining member operating mechanism (86, 98, 100, 128a, 128b) for operating a retaining member of said retaining mechanism;

a resilient member (1092, 1134) for pressing said retaining member in a direction opposite to the direction in which said retaining member is operated by said retaining member operating mechanism (86, 98, 100, 128a, 128b);

a main body [(1056)] supporting said retaining mechanism and said retaining member operating mechanism (86, 98, 100, 128a, 128b); and

a roller (216, 218) mounted on said main body [(1056)] and engaging said rail [(28)];

wherein said retaining member operating mechanism (86, 98, 100, 128a, 128b) operates said retaining member through operation of a drive mechanism [(1024)] disposed closely to said rail [(28)], and is displaced while being guided along said rail [(28)].

17. (Currently amended) A conveyance system according to claim 16, wherein said retaining mechanism comprises:

a clamp mechanism (~~1078a, 1078b~~) having a clamp (~~1096a, 1096b~~) operated by said retaining member operating mechanism; and

a holding mechanism (~~1080a, 1080b~~) having a set of plate members including at least one movable plate (~~1106, 1108~~), for holding a portion of said workpiece $[(1)]$ which is different from the portion thereof which is gripped by said clamp mechanism (~~1078a, 1078b~~), with said set of plate members;

wherein said clamp (~~1096a, 1096b~~) and said movable plate (~~1106, 1108~~) are displaced by said retaining member operating mechanism to hold or release said workpiece $[(1)]$.

18. (Currently amended) A conveyance system according to claim 16, wherein an engaging member $[(1074)]$ engageable by a hook $[(1038)]$ of a first lock mechanism $[(1036)]$ disposed closely to said rail $[(28)]$ when said retaining member operating mechanism operates said retaining member through operation of said drive mechanism, is mounted on said main body $[(1056)]$.

19. (Currently amended) A conveyance system according to claim 16, further comprising:

a pocket (~~1076a, 1076b~~) for supporting an end of said workpiece $[(1)]$ inserted therein.

20. (Currently amended) A conveyance system according to claim 19, wherein said pocket (~~1076a, 1076b~~), said clamp mechanism, and said holding mechanism (~~1080a, 1080b~~) are mounted on said main body successively upwardly in the order named, and an elongate member as said workpiece $[(1)]$ is conveyed in an upstanding state.

21. (Currently amended) A conveyance system according to claim 20, wherein the elongate member as said workpiece $[(1)]$ comprises a connecting rod for an internal combustion engine.

22. (Currently amended) A conveyance system according to claim 1, further comprising:
a conveyance carriage assembly stopping mechanism [(2010)] for stopping the conveyance carriage assembly [(12)] for carrying and conveying the workpiece [(1)];
said conveyance carriage assembly stopping mechanism [(2010)] comprising:
a stopping engaging member [(232)] mounted on said conveyance carriage assembly [(12)];
a first arm [(2100)] and a second arm [(2102)] which extend in a conveyance direction of said conveyance carriage assembly [(12)] and have respective shanks having pivotally supported ends;
a displacing mechanism [(2106)] for displacing said first arm [(2100)] and said second arm [(2102)] toward and away from each other; and
an entry path [(2110)] defined between said first arm [(2100)] and said second arm [(2102)] for said stopping engaging member [(232)] to enter, said entry path [(2110)] having a narrower portion [(2126)] having a width which is progressively smaller in a direction of travel of said stopping engaging member [(232)], and a wider portion [(2128)] which is wider than said narrower portion [(2126)];
wherein said conveyance carriage assembly [(12)] is decelerated when said first arm [(2100)] and said second arm [(2102)] slide against said stopping engaging member [(232)] in said narrower portion [(2126)]; and
said conveyance carriage assembly [(12)] which has entered said wider portion [(2128)] after said narrower portion [(2126)] is spread by said stopping engaging member [(232)] which presses said first arm [(2100)] and said second arm [(2102)], is stopped by said first arm [(2100)] and said second arm [(2102)] which engage said stopping engaging member [(232)].

23. (Currently amended) A conveyance system according to claim 22, wherein said first

arm [(2100)] and said second arm [(2102)] have a support [(2130)] which supports said stopping engaging member [(232)].

24. (Currently amended) A conveyance system according to claim 22, further comprising:

a second lock mechanism [(2108)] for positioning and fixing said conveyance carriage assembly [(12)] which is stopped, said second lock mechanism [(2108)] having a stopper engaging member [(2152)] for engaging a stopper [(238)] mounted on said conveyance carriage assembly [(12)].

25. (Currently amended) A conveyance system according to claim 22, wherein said stopping engaging member [(232)] comprises a rotatable cylinder.

26. (Currently amended) A conveyance system according to claim 22, wherein said stopping engaging member [(232)] doubles as a guided member which is guided by a direction-changing unit [(20)] which is interposed between a first conveyance section for conveying said conveyance carriage assembly [(12)] in one direction and a second conveyance section for conveying said conveyance carriage assembly [(12)] in a direction different from said one direction.

27. (Currently amended) A conveyance system according to claim 26, wherein each of conveyance carriages of said conveyance carriage assembly [(12)] has two stopping engaging members [(232)], each of said stopping engaging members [(232)] doubling as a guided member which is guided by said direction-changing unit [(20)] which interconnects a forward path as said first conveyance section and a return path as said second conveyance section for guiding said conveyance carriage assembly [(12)] in a direction opposite to said forward path.